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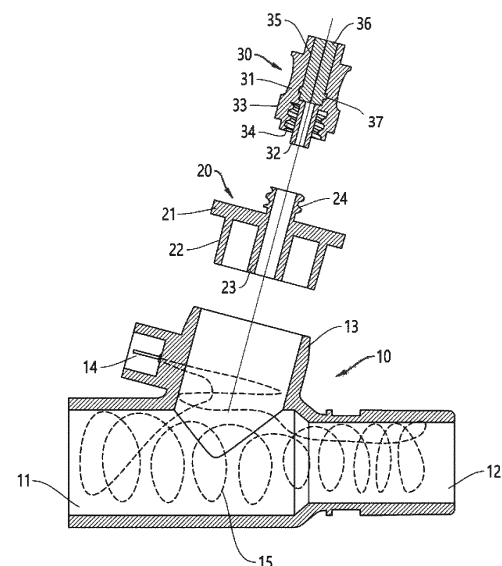
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(54) **VENTILATOR MEDICATION INJECTION STRUCTURE**

(57) Proposed is a ventilator medication injection structure. The structure includes a T-tube (10) which has a tube body that extends from an inlet (11) to an outlet (12) and which has a branch tube (13), a cover (20) having a first tube body (22) formed below a flange (21), the cover (20) having a second tube body (23) and a male screw (24), and includes a packing closure (30) having a third tube body (32), a fourth tube body (33), a female screw (34), and a packing (36) which has elasticity and which is disposed inside the body (31). The first tube body (22) is fitted and assembled to the branch tube (13), and medication is capable of being injected inside the T-tube (10) with a syringe by piercing the packing (36) with a syringe needle and passing the syringe needle through the third tube body (32).

[FIG.2]



Description

[Documents of Related Art]

Technical Field**[0007]**

[0001] The present disclosure relates to a ventilator medication injection structure mounted on a hose path connecting a ventilator to a patient's mask so that medication is capable of being included in air conditioned by the ventilator, thereby being capable of providing the medication to the patient.

5 (Patent Document 1) KR 10-2007-0106964 A
 (Patent Document 2) KR 10-1137052 B2
 (Patent Document 3) KR 10-2007-0004058 A
 (Patent Document 4) KR 10-2010-0060004 A
 (Patent Document 5) KR 10-1459399 B1

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Background Art**Disclosure****Technical Problem**

[0002] Generally, a patient who has difficulty in spontaneous breathing relies on a ventilator to breathe. In addition, medication may be prescribed according to a decision of a doctor, and the medication may be included in air conditioned in a ventilator and then provided to a patient. Various medications may be used according to a patient's physical condition and, for example, medication that helps a lung function may be used when a patient's lung function is bad.

15 **[0008]** Accordingly, the present disclosure has been made keeping in mind the above problems occurring in the related art, and an objective of the present disclosure is to provide a ventilator medication injection structure capable of minimizing an exposure of an inner portion of a medication case when medication is injected, the structure being capable of preventing the medication case from being contaminated, and the structure being configured such that a patient can live in a more strictly clean environment.

[0003] Conventionally, in order to inject medication, a T-tube is disposed on a tube that is connected to a mask or a mouthpiece from a ventilator, a medication case is mounted on one side of an inlet of the T-tube, and the medication is injected into the medication case. In addition, an open portion of the medication case is covered with a lid so as to prevent contamination.

20 **[0009]** Another objective of the present disclosure is to provide a ventilator medication injection structure configured to reheat air conditioned in a ventilator when the temperature of the conditioned air becomes lower than an appropriate temperature while the conditioned air moving along a tube although the conditioned air has been heated to the appropriate temperature, thereby being capable of providing the conditioned air having the appropriate temperature to a patient.

[0004] The T-tube is provided with a medication vaporizing apparatus, and the medication is vaporized using the medication vaporizing apparatus and the vaporized medication is included in conditioned air, and then the vaporized medication is provided to a patient.

Technical Solution

[0005] However, as described above, a conventional technology has problems such as contamination, labor, cost, and so on. More specifically, although a timing of medication injection varies according to a prescription of a doctor, the timing may be set such that medication is injected approximately two to four times a day, and the lid is then removed and closed each time. In this process, there are problems in that a time for which the medication case is exposed is prolonged inevitably, the possibility of contamination may increase, there is the hassle of opening and closing the lid, and the cost increases since a tube replacement cycle is fast as the possibility of contamination is high.

35 **[0010]** In order to achieve the above objectives, according to an embodiment of the present disclosure, there is provided a ventilator medication injection structure including: a T-tube 10 having a tube body extending from an inlet 11 to an outlet 12, with a branch tube 13 being formed on one side of the tube body; a cover 20 having a first tube body 22 formed below a flange 21, a second tube body 23 formed inside the first tube body 22 such that the second tube body 23 penetrates the flange 21, and a male screw 24 formed on an outer peripheral surface of the second tube body 23; and a packing closure 30 having a third tube body 32 formed at a center of a body 31 such that the third tube body 32 is fitted inside the second tube body 23, a fourth tube body 33 formed on an outside of the third tube body 32, a female screw 34 formed on the fourth tube body 33, the female screw 34 being fastened to the male screw 24, and a packing 36 which has elasticity and which is disposed inside the body 31.

[0006] Meanwhile, the ventilator is configured to purify air, to heat the air to the temperature similar to body temperature, to appropriately adjust the pressure of the air, and to provide the air that is conditioned to a patient. However, the temperature of the conditioned air may be changed while the conditioned air is moved along the tube, and there is a problem that the air having a low temperature is provided to a patient's respiratory organs.

40 **[0011]** The first tube body 22 is fitted and assembled to the branch tube 13, and medication is capable of being injected inside the T-tube 10 with a syringe by piercing

the packing 36 with a syringe needle and passing the syringe needle through the third tube body 32.

[0012] In addition, in the ventilator medication injection structure according to an embodiment of the present disclosure, the first tube body 22 may be provided in a tapered shape having a narrow lower side, and may be formed of a material having elasticity.

[0013] In addition, in the ventilator medication injection structure according to an embodiment of the present disclosure, a power connector 14 to which an external power source is connected may be disposed on one side of the T-tube 10, a heating wire 15 may be disposed inside the T-tube 10, and the heating wire 15 may be configured to be connected to the external power source and is configured to heat conditioned air.

[0014] Details of other embodiments are included in the detailed description and drawings.

Advantageous Effects

[0015] In the ventilator medication injection structure according to an embodiment of the present disclosure, medication is capable of being injected into the T-tube 10 while the syringe needle is inserted into the packing 36, and the packing 36 is configured such that a space through which the syringe needle was passed is blocked when the syringe needle is removed from the packing 36, so that an inner portion of the T-tube 10 is capable of being fundamentally prevented from being exposed.

[0016] Accordingly, in the ventilator medication injection structure according to an embodiment of the present disclosure, an exposure of an inner portion of the medication case may be minimized or the exposure of the inner portion of the medication case may be fundamentally prevented, so that the medication case is capable of being prevented from being contaminated. Furthermore, a patient can live in a more strictly clean environment.

[0017] Therefore, in the ventilator medication injection structure according to an embodiment of the present disclosure, even when the temperature of conditioned air to be provided to a patient is low, the conditioned air is capable of being reheated, so that the patient can always breathe the conditioned air having an appropriate temperature.

Description of Drawings

[0018]

FIG. 1 to FIG. 3 are views illustrating a ventilator medication injection structure according to an embodiment of the present disclosure, in which FIG. 1 is a view illustrating an external appearance of the ventilator medication injection structure, FIG. 2 is an exploded cross-sectional view in which elements of the ventilator medication injection structure are disassembled, and FIG. 3 is a cross-sectional view in

which the elements are assembled.

FIG. 4 is a view illustrating a cover in the ventilator medication injection structure according to an embodiment of the present disclosure.

Best Mode

[0019] The attached drawings for illustrating exemplary embodiments of the present disclosure are referred to in order to gain a sufficient understanding of the present disclosure, the merits thereof, and the objectives accomplished by the implementation of the present disclosure.

[0020] Hereinafter, embodiments of the present disclosure will be described in detail with reference to the accompanying drawings. It should be understood that the embodiments described below are illustratively shown to aid understanding of the present disclosure, and that the present disclosure may be implemented with various modifications different from the embodiments described herein. However, when it is determined that a detailed description of a related well-known function or component may unnecessarily obscure the gist of the present disclosure while describing the present disclosure, the detailed description and specific illustration thereof will be omitted. In addition, the accompanying drawings may not be drawn to scale, but the size of some components may be exaggerated to aid in understanding of the present disclosure.

[0021] Terms such as 'first' and 'second' are used herein merely to describe a variety of constituent elements, but the constituent elements are not limited by the terms. The terms are used only for the purpose of distinguishing one constituent element from another constituent element. For example, a first element may be termed a second element, and a second element may be termed a first element, without departing from the scope of the present disclosure.

[0022] The terms used in the specification are defined in consideration of functions used in the present disclosure, and can be changed according to the intent or conventionally used methods of producers. Accordingly, definitions of the terms should be understood on the basis of the entire description of the present specification.

[0023] Like reference numerals refer to like elements throughout the specification.

[Description of Reference Numerals]

[0024]

10: T-tube 11: inlet
12: outlet 13: branch tube
14: power connector 15: heating wire
20: cover 21: flange
22, 23: first and second tube bodies 24: male screw
30: packing closure 31: body
32, 33: third and fourth tube bodies 34: female screw
35: pocket 36: packing

Mode for Invention

[0025] Hereinafter, referring to FIG. 1 to FIG. 4, a ventilator medication injection structure according to an embodiment of the present disclosure will be described. FIG. 1 to FIG. 3 are views illustrating a ventilator medication injection structure according to an embodiment of the present disclosure, in which FIG. 1 is a view illustrating an external appearance of the ventilator medication injection structure, FIG. 2 is an exploded cross-sectional view in which elements of the ventilator medication injection structure are disassembled, and FIG. 3 is a cross-sectional view in which the elements are assembled. FIG. 4 is a view illustrating a cover in the ventilator medication injection structure according to an embodiment of the present disclosure.

[0026] A ventilator medication injection structure according to an embodiment of the present disclosure may include a T-tube 10, a cover 20, and a packing closure 30.

[0027] As illustrated in FIG. 1 to FIG. 3, in the T-tube 10, a tube body extends from an inlet 11 to an outlet 12, and a branch tube 13 is formed on one side of the tube body.

[0028] As illustrated in FIG. 2, in the cover 20, a first tube body 22 is formed below a flange 21, and a second tube body 23 is formed inside the first tube body 22 such that the second tube body 23 penetrates the flange 21. A male screw 24 is formed on an outer peripheral surface of the second tube body 23.

[0029] As illustrated in FIG. 3, the first tube body 22 is fitted and assembled to the branch tube 13.

[0030] In the packing closure 30, a third tube body 32 is formed at a center of a body 31 such that the third tube body 32 is fitted inside the second tube body 23. A fourth tube body 33 is formed on an outside of the third tube body 32, and a female screw 34 is formed on the fourth tube body 33. As illustrated in FIG. 3, the female screw 34 is fastened to the male screw 24.

[0031] In addition, a pocket 35 is formed inside the body 31, and the pocket 35 may be densely filled with a packing 36.

[0032] The packing 36 has elasticity. More specifically, the packing 36 may be formed of soft rubber. Accordingly, when a syringe needle pierces the packing 36, the syringe needle may penetrate the packing 36. Furthermore, when the syringe needle is pulled out, a piercing made by the syringe needle is immediately filled by the elasticity of the packing 36.

[0033] Medication may be injected inside the T-tube 10 with a syringe by piercing the packing 36 with the syringe needle and passing the syringe needle through the third tube body 32.

[0034] In the ventilator medication injection structure according to an embodiment of the present disclosure, medication is capable of being injected into the T-tube 10 while a syringe needle is inserted into the packing 36, and the packing 36 is configured such that a space through which the syringe needle was passed is blocked

when the syringe needle is removed from the packing 36, so that an inner portion of the T-tube 10 is capable of being fundamentally prevented from being exposed.

[0035] Accordingly, in the ventilator medication injection structure according to an embodiment of the present disclosure, the exposure of the inner portion of the T-tube 10 that serves as a medication case may be minimized or the medication case may be fundamentally blocked from being exposed, so that contamination of the medication case is prevented. Furthermore, a patient can live in a more strictly clean environment.

[0036] In addition, by preventing the exposure of the inner portion of the T-tube 10, an entire section of the tube connected from the ventilator to a mask or a mouth-piece may be strictly prevented from being exposed to the outside.

[0037] Meanwhile, as illustrated in FIG. 4, the first tube body 22 may be provided in a tapered shape having a narrow lower side, and may be formed of a material having elasticity. Accordingly, as illustrated in FIG. 2 and FIG. 3, when the ventilator medication injection structure in a disassembled state is assembled, the cover 20 is capable of being fitted and assembled in a straight direction without rotating the cover 20.

[0038] Since the first tube body 22 is provided in the tapered shape, the first tube body 22 is easily assembled due to a large diameter difference at the beginning of assembly when the first tube body 22 is inserted into the branch tube 13, and the first tube body 22 may be assembled more and more tightly as the assembly progresses.

[0039] In addition, since the first tube body 22 has an elastic property, the first tube body 22 is in close contact with an entire of inner peripheral surface of the branch tube 13, so that contaminants from the outside may be fundamentally prevented from being introduced into the inner portion of the T-tube 10.

[0040] On the other hand, as illustrated in FIG. 1 to FIG. 3, a power connector 14 to which an external power source is capable of being connected is disposed on one side of the T-tube 10.

[0041] As illustrated in FIG. 2 and FIG. 3, a heating wire 15 may be disposed inside the T-tube 10, the heating wire 15 may generate heat by being connected to the external power source, and air conditioned as described above may be heated by the heat.

[0042] Therefore, in the ventilator medication injection structure according to an embodiment of the present disclosure, even when the temperature of conditioned air to be provided to a patient is low, the conditioned air is capable of being reheated, and the patient can always breathe the conditioned air at an appropriate temperature.

[0043] Although an exemplary embodiment of the present disclosure was described above with reference to the accompanying drawings, those skilled in the art would understand that the present disclosure may be implemented in various ways without changing the neces-

sary features or the spirit of the present disclosure.

[0044] Therefore, it should be understood that the embodiment described above is not limitative, but only an example in all respects, the scope of the present disclosure is expressed by claims described below, not the detailed description, and it should be construed that all of changes and modifications achieved from the meanings and scope of claims and equivalent concept are included in the scope of the present disclosure.

Industrial Applicability

[0045] A ventilator medication injection structure according to an embodiment of the present disclosure may be used for including medication in conditioned air and for heating the conditioned air when the conditioned air that is conditioned from a ventilator is provided to a patient.

Claims

1. A ventilator medication injection structure comprising:

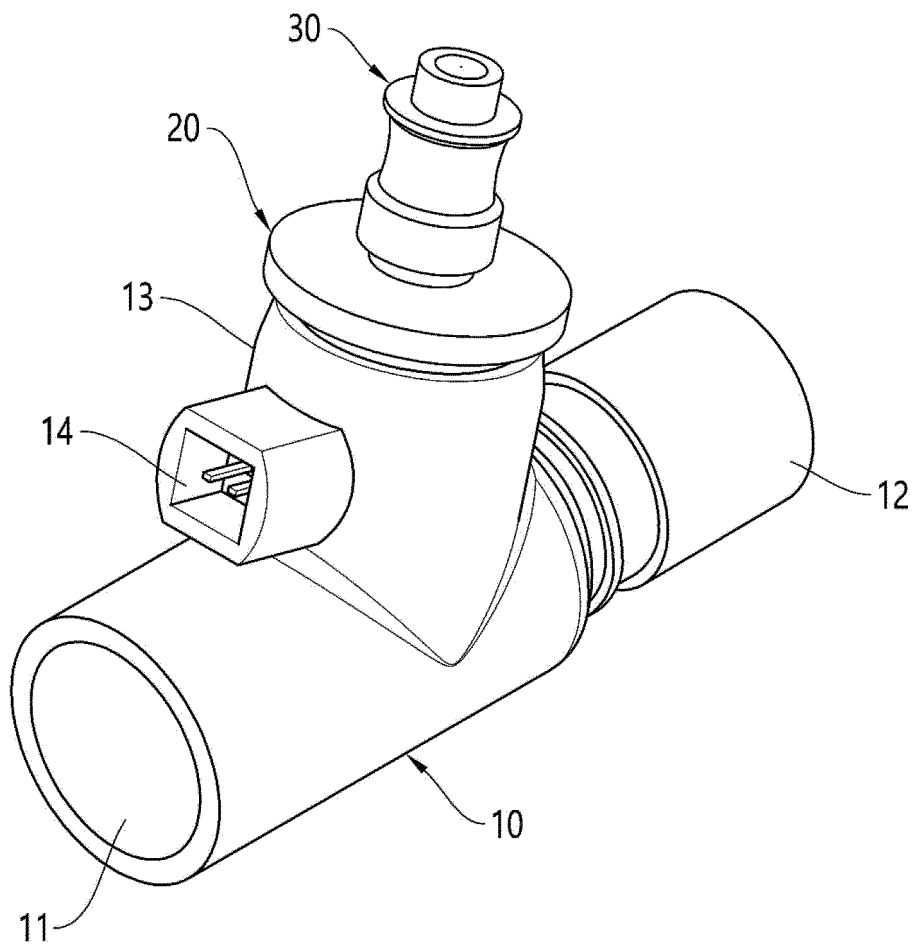
a T-tube (10) having a tube body extending from an inlet (11) to an outlet (12), with a branch tube (13) being formed on one side of the tube body; a cover (20) having a first tube body (22) formed below a flange (21), a second tube body (23) formed inside the first tube body (22) such that the second tube body (23) penetrates the flange (21), and a male screw (24) formed on an outer peripheral surface of the second tube body (23); and

a packing closure (30) having a third tube body (32) formed at a center of a body (31) such that the third tube body (32) is fitted inside the second tube body (23), a fourth tube body (33) formed on an outside of the third tube body (32), a female screw (34) formed on the fourth tube body (33) and fastened to the male screw (24), and a packing (36) which has elasticity and which is disposed inside the body (31), wherein the first tube body (22) is fitted and assembled to the branch tube (13), and medication is capable of being injected inside the T-tube (10) with a syringe by piercing the packing (36) with a syringe needle and passing the syringe needle through the third tube body (32).

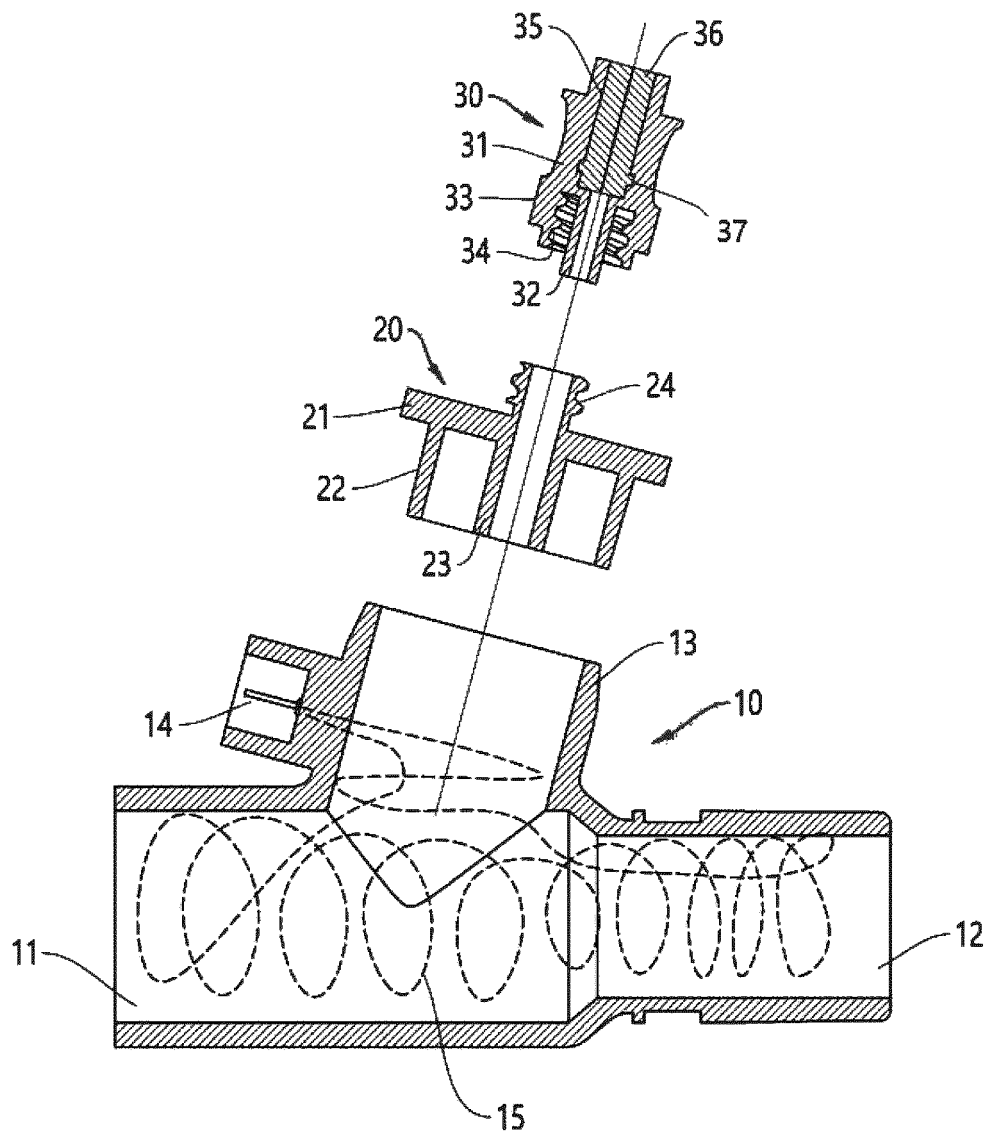
2. The ventilator medication injection structure of claim 1, wherein the first tube body (22) is provided in a tapered shape having a narrow lower side, and is formed of a material having elasticity.
3. The ventilator medication injection structure of claim 1, wherein a power connector (14) to which an ex-

ternal power source is connected is disposed on one side of the T-tube (10), a heating wire (15) is disposed inside the T-tube (10), and the heating wire (15) is configured to be connected to the external power source and is configured to heat conditioned air.

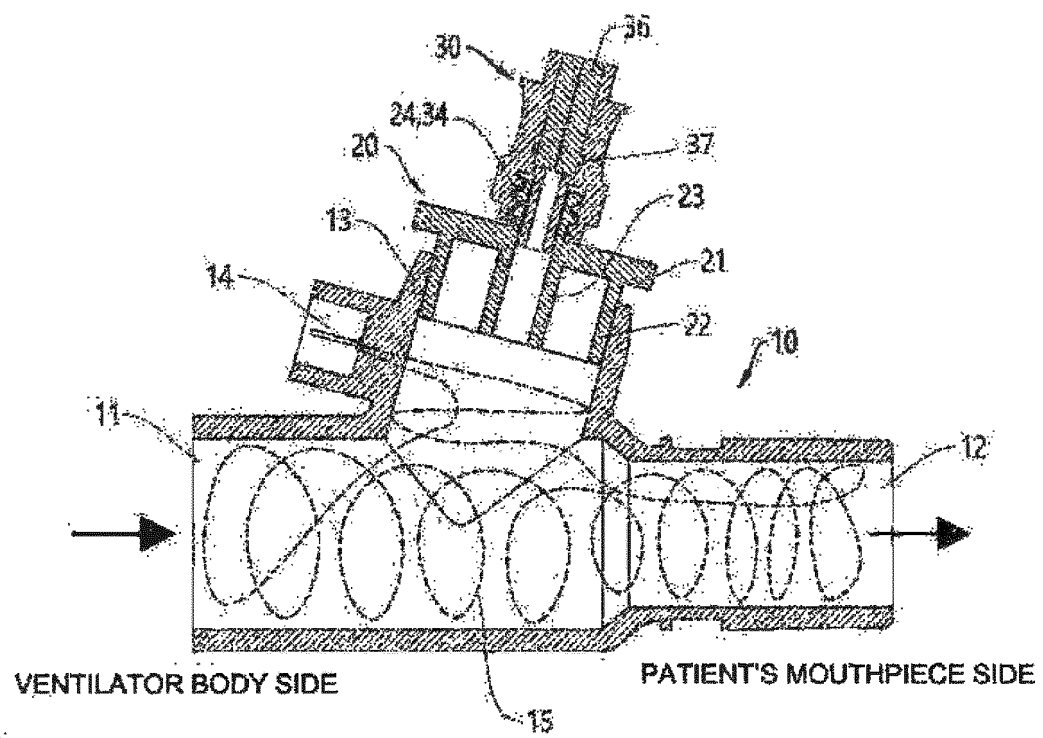
[FIG.1]



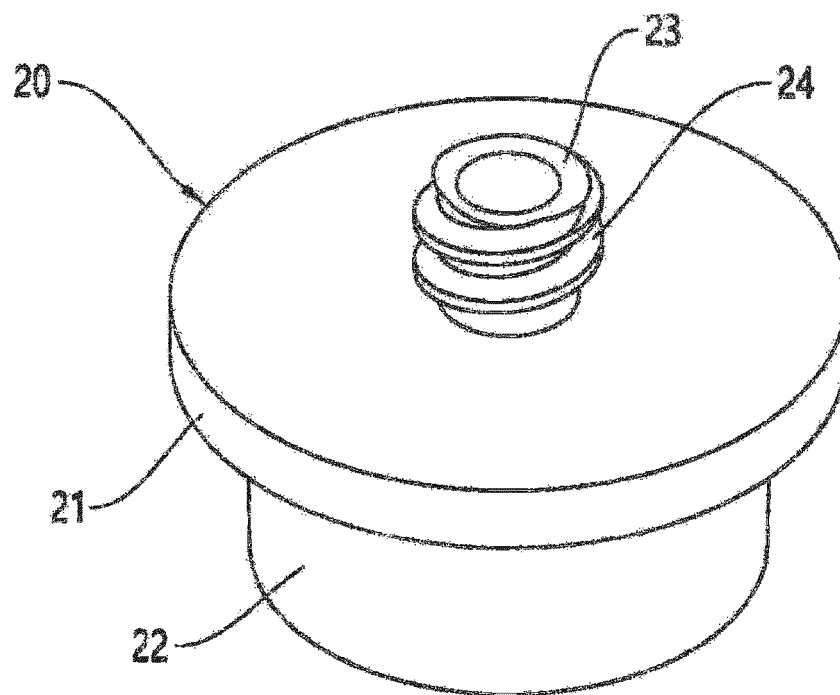
[FIG.2]



[FIG.3]



[FIG.4]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2022/004024

A. CLASSIFICATION OF SUBJECT MATTER A61M 16/12(2006.01)i; A61M 16/10(2006.01)i; A61M 16/08(2006.01)i According to International Patent Classification (IPC) or to both national classification and IPC																		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A61M 16/12(2006.01); A61M 11/00(2006.01); A61M 15/00(2006.01); A61M 16/08(2006.01); A61M 16/10(2006.01); A61M 16/16(2006.01); A61M 16/20(2006.01); A61M 25/088(2006.01); A61M 25/16(2006.01); A61M 39/10(2006.01); A61M 5/14(2006.01); F16K 15/14(2006.01) Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean utility models and applications for utility models: IPC as above Japanese utility models and applications for utility models: IPC as above Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS (KIPO internal) & keywords: 인공 호흡기(respirator), 약물(drug), 주입(injection), 관체(tube body), T관(T pipe), 플랜지(flange), 커버(cover), 패킹 클로저(packing closure), 테이퍼(taper), 탄성(elasticity), 가열(heat)																		
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>KR 10-2011-0034633 A (CAREFUSION 2200, INC.) 05 April 2011 (2011-04-05) See paragraphs [0010]-[0022], and figures 1-7.</td> <td>1-3</td> </tr> <tr> <td>Y</td> <td>KR 10-1311751 B1 (NOVARTIS AG) 26 September 2013 (2013-09-26) See abstract, claim 1, paragraph [0038], and figure 8.</td> <td>1-3</td> </tr> <tr> <td>Y</td> <td>KR 10-2008-0017375 A (NEKTAR THERAPEUTICS) 26 February 2008 (2008-02-26) See paragraphs [0149]-[0150] and [0178], and figure 35.</td> <td>3</td> </tr> <tr> <td>A</td> <td>KR 10-2019-0030976 A (PARK, Man Shick) 25 March 2019 (2019-03-25) See entire document.</td> <td>1-3</td> </tr> <tr> <td>A</td> <td>KR 10-1424934 B1 (KOREA UNIVERSITY RESEARCH AND BUSINESS FOUNDATION) 04 August 2014 (2014-08-04) See entire document.</td> <td>1-3</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	KR 10-2011-0034633 A (CAREFUSION 2200, INC.) 05 April 2011 (2011-04-05) See paragraphs [0010]-[0022], and figures 1-7.	1-3	Y	KR 10-1311751 B1 (NOVARTIS AG) 26 September 2013 (2013-09-26) See abstract, claim 1, paragraph [0038], and figure 8.	1-3	Y	KR 10-2008-0017375 A (NEKTAR THERAPEUTICS) 26 February 2008 (2008-02-26) See paragraphs [0149]-[0150] and [0178], and figure 35.	3	A	KR 10-2019-0030976 A (PARK, Man Shick) 25 March 2019 (2019-03-25) See entire document.	1-3	A	KR 10-1424934 B1 (KOREA UNIVERSITY RESEARCH AND BUSINESS FOUNDATION) 04 August 2014 (2014-08-04) See entire document.	1-3
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex. <table> <tr> <td> * Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "D" document cited by the applicant in the international application "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family </td> </tr> </table>	* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "D" document cited by the applicant in the international application "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family																
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Name and mailing address of the ISA/KR Korean Intellectual Property Office Government Complex-Daejeon Building 4, 189 Cheongsaro, Seo-gu, Daejeon 35208 Facsimile No. +82-42-481-8578	Authorized officer Telephone No.																	

Form PCT/ISA/210 (second sheet) (July 2019)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2022/004024

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 7600511 B2 (POWER, J. et al.) 13 October 2009 (2009-10-13) See entire document.	1-3

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2022/004024

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